

REMARKS

I. Status of the Claims and the Rejections

Claims 22, 24-27, 29, 31, 32, 34-40, and 42 were rejected under 35 U.S.C. § 103(a) for obviousness based on Fischer et al U.S. Patent No. 5,513,500 ("Fischer '500") in view of Foye U.S. Patent No. 4,487,028 ("Foye '028"). Claims 28 and 41 were rejected under 35 U.S.C. § 103(a) for obviousness based on Fischer '500 in view of Foye '028 and Schuett U.S. Patent No. 3,216,215 ("Schuett '215"). Claims 22, 24-29, 31, 32, and 34-42 remain pending in this application and claim 43 has been added. Applicants respectfully request reconsideration in view of the following remarks.

II. Claims 22, 24-27, 29, 31, 32, 34-40, and 42 are Non-Obvious

A. The Claims

Claim 22 recites "a refrigerating installation (12), including at least two refrigeration machines (18, 20) which operate independently of one another in parallel" and "a central control unit operatively coupled to the refrigerating installation (12) and controlling the refrigeration capacity of the at least two refrigeration machines (18, 20) depending on at least one parameter indicating the current refrigeration demand, such that each of the at least two refrigeration machines (18, 20) operates, on the average, for substantially the same amount of time." The remaining rejected claims depend directly or indirectly from claim 22 and add additional details or features of the claimed cooling system. For example, claim 26 requires that the refrigeration machines generate cold with a vapor cycle refrigeration process, while claim 37 requires that a shut-off valve be assigned to each refrigeration machine.

B. The Deficiencies of the Cited Prior Art

Fischer '500 is directed to a system for cooling food trolleys in the cabin of an aircraft. As shown in Fig. 2, Fischer '500 discloses a central cooling plant (4) located underneath the cabin of an aircraft and selectively coupled to heat exchangers (9A, 9B) in the aircraft galleys via a supply conduit (5) and a return conduit (6). The heat exchangers (9A, 9B) in the galleys are coupled to the supply and return conduits (5, 6) using a plurality of connector conduits (10A, 10B, 11A, 11B). This purportedly allows quick connection and disconnection of the cooling system (1) in cases where the cabin is reorganized and the galleys repositioned within the aircraft. The current Office Action acknowledges that Fischer '500 does not disclose two refrigeration machines operating in parallel. Nevertheless, the Office Action cites Foye '028 as allegedly disclosing air condition systems in parallel, and concludes that it would have been obvious to modify the Fischer '500 cooling system to include two refrigeration machines and a control system which operates the refrigeration machines approximately equal amounts of time.

However, Fischer '500 teaches away from the use of parallel cooling systems. Fischer '500 observes that "it is especially advantageous that a single central cooling plant provides the necessary cooling capacity for all of the galleys in the aircraft" because "a considerable saving of space and weight is achieved in each galley" (Col. 2, ll. 30-36). Thus, a person of ordinary skill in the art would not sacrifice this "considerable saving of space and weight" in Fischer '500 by adding a duplicate parallel refrigeration system as alluded to in Foye '028. And the Patent Office cannot ignore this teaching of Fischer '500, which diverges from the substance of claim 22. Stated another way, combining these elements of Fischer '500 and Foye '028, in the manner indicated, would require the person of ordinary skill in the art to completely ignore the expressly stated benefits of the Fischer '500 cooling system. Therefore, this combination is improper and should be withdrawn.

Additionally, even if the references were combined, the combination would still fail to disclose a central control unit that operates the two refrigeration machines roughly equally in terms of time. More particularly, Fischer '500 is completely silent about control units, and Foye '028 fails to teach equal operation of parallel air conditioning systems. Illustrated schematically in Fig. 1, first and second refrigeration systems (11, 12) includes separate pumps (19, 20) and separate compressors (23, 24). Foye '028 explains that the first and second compressors (23, 24) each include two stages "to provide four levels of variable capacity in the chiller system" (Col. 3, ll. 26-29). Foye '028 then describes a detailed control algorithm in which each calculation checks if "the number of stages loaded equals the number of stages that may be loaded without starting an additional pump" (Col. 10, ll. 1-30). This indicates that the control system of Foye '028 seeks to limit the number of times either of the pumps (19, 20) is engaged, which does not comport with a control system that seeks to run the two refrigeration systems equally in terms of time. As detailed as the control algorithm description is in Foye '028, one having skill in the art would expect that such an important change to the control algorithm of Foye '028 would have been at least mentioned in the detailed description. Consequently, the combination of Fischer '500 and Foye '028 fails to disclose a central control unit that operates the two refrigeration machines roughly equally in terms of time.

Each of claims 24-27, 29, 31, 32, 34-40, and 42 depends from independent claim 22, and recites one or more additional features in combination with the features of claim 22. For substantially the same reasons set forth above with respect to claim 22, and further because the relied upon prior art does not support an obviousness rejection as to any of these combinations of elements, each of claims 24-27, 29, 31, 32, 34-40, and 42 is also patentable. Applicants respectfully request that the rejection of claims 22, 24-27, 29, 31, 32, 34-40, and 42 now be withdrawn.

III. Claims 28 and 41 are Non-Obvious

A. The Claims

Claims 28 and 41 depend from independent claim 22, which is allowable for the reasons discussed previously. Claim 28 is directed to including a refrigeration store that compensates for thermal expansion or leakage losses of the refrigerant, while claim 41 is directed to altering the amount of refrigerating agent in the refrigeration transport system to influence the refrigeration capacity of the cooling system.

B. The Deficiencies of the Cited Prior Art

The rejection of claims 28 and 41 relies on the previous rejection of claim 22 in light of Fischer '500 and Foye '028. Schuett '215 fails to overcome the deficiencies of Fischer '500 and Foye '028. Schuett '215 is directed to a chicken egg incubator, which is non-analogous art to the cooling systems of Fischer '500 and Foye '028. Thus, Schuett '215 would likely not be combined with Fischer '500 or Foye '028 by one of ordinary skill in the art. Nevertheless, even if the cited references were combined, Schuett '215 fails to teach two refrigeration machines operated in parallel, or a central control unit that operates the two refrigeration machines approximately equally in terms of time. Therefore, claims 28 and 41 are not obvious in view of Fischer '500, Foye '028, and Schuett '215. Applicants respectfully request that the rejection of claims 28 and 41 now be withdrawn.

IV. New Claim

Applicants have added new independent claim 43 to further define the patentable subject matter in this application. Claim 43 is completely supported in the original specification and recites a method for cooling heat generating installations in an aircraft. The method includes

"coupling at least two refrigeration machines in parallel to a refrigeration transport system in the aircraft" and "operating the at least two refrigeration machines for an equal amount of time on average." Claim 43 is allowable over the currently-cited references. As discussed previously, Fischer '500 teaches away from adding a second refrigeration machine in an aircraft because Fischer '500 is focused on reducing the weight of an aircraft. Additionally, Fischer '500 and Foye '028 are completely silent about operating refrigeration machines an equal amount of time on average. Consequently, Fischer '500 and Foye '028 do not anticipate or render obvious each step of claim 43. Applicants respectfully request the allowance of claim 43.

V. Conclusion

Based on the amendments to the claims and these remarks, Applicants respectfully assert that this case is in condition for allowance, and respectfully request a notice to that effect. If the Examiner believes any issue requires further discussion, the Examiner is respectfully asked to telephone the undersigned attorney so that the matter may be promptly resolved.

Applicants do not believe that any fee is due in connection with this submission. However, if any additional fees are necessary to complete this communication, the Commissioner may consider this to be a request for such and charge any necessary fees to Deposit Account No. 23-3000.

Respectfully submitted,
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